	Type	L #	Hits	Search Text	DBs
1	BRS	L1	14264	microfluid$6	US-PGPUB; USPAT
2	BRS	L2	3169	1 and actuat$9	US-PGPUB; USPAT
3	BRS	L3	225	1 and gas near8 actuat$9	US-PGPUB; USPAT
4	BRS	L4	101	1 and thermopneumat$9 near8 actuat$9	US-PGPUB; USPAT
5	BRS	L6	11559	1 and concentrat$9	US-PGPUB; USPAT
6	BRS	L7	339	1 and microdroplet	US-PGPUB; USPAT
7	BRS	L8	163	2 and microdroplet	US-PGPUB; USPAT
8	BRS	L9	367	2 and enrich$9	US-PGPUB; USPAT
9	BRS	L10	22	8 and enrich$9	US-PGPUB; USPAT
10	BRS	L11	147	8 and concentrat$9	US-PGPUB; USPAT
11	BRS	L12	125	8 and filter	US-PGPUB; USPAT
12	BRS	L13	7925	1 and filter	US-PGPUB; USPAT
13	BRS	L14	1550	2 and filter	US-PGPUB; USPAT
14	BRS	L15	103	3 and filter	US-PGPUB; USPAT
15	BRS	L16	125	8 and filter	US-PGPUB; USPAT

	Type	L #	Hits	Search Text	DBs
16	BRS	L17	140	8 and (filter or porous or membrane)	US-PGPUB; USPAT
17	BRS	L5	395	1 and pneumat$9 near8 actuat$9	US-PGPUB; USPAT
18	BRS	L18	1817	1 and actuat$9 same (channel or microchannel or chamber or reservoir)	US-PGPUB; USPAT
19	BRS	L19	178	3 and actuat$9 same (channel or microchannel or chamber or reservoir)	US-PGPUB; USPAT
20	BRS	L20	90	4 and actuat$9 same (channel or microchannel or chamber or reservoir)	US-PGPUB; USPAT

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=> s microfluid?
L1 20656 MICROFLUID?

=> s l1 and actuat?
L2 1753 L1 AND ACTUAT?

=> s l1 and gas (8w) actuat?
L3 25 L1 AND GAS (8W) ACTUAT?

=> s l1 and microdroplet
L4 136 L1 AND MICRODROPLET

=> s l4 and gas (8w) actuat?
L5 0 L4 AND GAS (8W) ACTUAT?

=> s l4 and thermopneumat? (8w) actuat?
L6 0 L4 AND THERMOPNEUMAT? (8W) ACTUAT?

=> s l1 and thermopneumat? (8w) actuat?
L7 38 L1 AND THERMOPNEUMAT? (8W) ACTUAT?

=> display l3 1-25 ibib abs

L3 ANSWER 1 OF 25 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1075981 CAPLUS
DOCUMENT NUMBER: 143:362791
TITLE: Removable microfluidic flow cell with microarray
INVENTOR(S): Peytavi, Regis
PATENT ASSIGNEE(S): Infectio Recherche Inc., Can.
SOURCE: PCT Int. Appl., 78 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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NEWS 4	DEC 18	CA/CAplus patent kind codes updated
NEWS 5	DEC 18	MARPAT to CA/CAplus accession number crossover limit increased to 50,000
NEWS 6	DEC 18	MEDLINE updated in preparation for 2007 reload
NEWS 7	DEC 27	CA/CAplus enhanced with more pre-1907 records
NEWS 8	JAN 08	CHEMLIST enhanced with New Zealand Inventory of Chemicals
NEWS 9	JAN 16	CA/CAplus Company Name Thesaurus enhanced and reloaded
NEWS 10	JAN 16	IPC version 2007.01 thesaurus available on STN
NEWS 11	JAN 16	WPIDS/WPINDEX/WPIX enhanced with IPC 8 reclassification data
NEWS 12	JAN 22	CA/CAplus updated with revised CAS roles
NEWS 13	JAN 22	CA/CAplus enhanced with patent applications from India
NEWS 14	JAN 29	PHAR reloaded with new search and display fields
NEWS 15	JAN 29	CAS Registry Number crossover limit increased to 300,000 in multiple databases
NEWS 16	FEB 15	PATDPASPC enhanced with Drug Approval numbers
NEWS 17	FEB 15	RUSSIAPAT enhanced with pre-1994 records
NEWS 18	FEB 23	KOREAPAT enhanced with IPC 8 features and functionality
NEWS 19	FEB 26	MEDLINE reloaded with enhancements
NEWS 20	FEB 26	EMBASE enhanced with Clinical Trial Number field
NEWS 21	FEB 26	TOXCENTER enhanced with reloaded MEDLINE
NEWS 22	FEB 26	IFICDB/IFIPAT/IFIUDB reloaded with enhancements
NEWS 23	FEB 26	CAS Registry Number crossover limit increased from 10,000 to 300,000 in multiple databases
NEWS 24	MAR 15	WPIDS/WPIX enhanced with new FRAGHITSTR display format
NEWS 25	MAR 16	CASREACT coverage extended
NEWS 26	MAR 20	MARPAT now updated daily
NEWS 27	MAR 22	LWPI reloaded
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NEWS LOGIN	Welcome Banner and News Items
NEWS IPC8	For general information regarding STN implementation of IPC 8
NEWS X25	X.25 communication option no longer available

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PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005093388	A1	20051006	WO 2005-CA458	20050329
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2559778	A1	20051006	CA 2005-2559778	20050329
EP 1728062	A1	20061206	EP 2005-714680	20050329
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR				

PRIORITY APPLN. INFO.: US 2004-556372P P 20040326
WO 2005-CA458 W 20050329

AB A microfluidic flow cell for removably interfacing with a removable-member for performing a reaction there between. The microfluidic flow cell device comprises at least one reaction portion defining with the removable-member a reaction chamber when in an interfaced position thereof. The microfluidic flow cell comprises at least one fluid-receiving portion for receiving a fluid therein and being in fluid communication with the reaction chamber. When the microfluidic flow cell and the removable-member are in the interfaced position, the cell is adapted to allow for the fluid in the fluid-receiving portion to flow to the reaction chamber. Devices, systems and methods comprising this microfluidic flow cell are also disclosed.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 25 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:126329 CAPLUS
DOCUMENT NUMBER: 138:347318
TITLE: A two-stage discrete peristaltic micropump
AUTHOR(S): Berg, J. M.; Anderson, R.; Anaya, M.; Lahlouh, B.; Holtz, M.; Dallas, T.
CORPORATE SOURCE: Department of Mechanical Engineering, Texas Tech University, Lubbock, TX, 79409, USA
SOURCE: Sensors and Actuators, A: Physical (2003), A104(1), 6-10
CODEN: SAAPEB; ISSN: 0924-4247
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The authors demonstrate a discrete, two-stage peristaltic micropump for applications in microfluidics. Prototypes are fabricated in polydimethylsiloxane (PDMS) with H2O as the working fluid. Off-wafer compressed N gas provides the actuation energy. The device may be operated in three- or two-stage modes for direct comparison. Two-stage pumps have comparable flow rates to the three-stage counterparts, and produce .apprx.2/3 the static head. The authors' results suggest that two-stage pumps may be a viable choice under low back pressure conditions where available on-chip area or the number of external connections is limited.

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 25 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:748970 CAPLUS
TITLE: Methods and systems for moving fluid in a microfluidic device
INVENTOR(S): Handique, Kalyan; Parunak, Gene
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., Cont.-in-part of Ser. No. US 2001-14519, filed on 14 Dec 2001 which is a continu
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 8
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002142471	A1	20021003	US 2002-75371	20020215
US 2002143437	A1	20021003	US 2001-819105	20010328
US 7010391	B2	20060307		
US 2002142482	A1	20021003	US 2001-14519	20011214
US 7192557	B2	20070320		
WO 2003012406	A1	20030213	WO 2002-US9440	20020327
WO 2003012406	A9	20030320		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1438567	A1	20040721	EP 2002-715213	20020327
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004537695	T	20041216	JP 2003-517479	20020327

PRIORITY APPLN. INFO.:

US 2001-819105	A2	20010328
US 2001-307638P	P	20010726
US 2001-953921	A2	20010918
US 2001-14519	A2	20011214
US 2001-14520	A	20011214
US 2002-75371	A	20020215
WO 2002-US9440	W	20020327
WO 2002-US9441	W	20020327

AB The present invention relates to a system and method for moving samples, such as fluid, within a microfluidic system using a plurality of gas actuators for applying pressure at different locations within the microfluidic. The system includes a substrate which forms a fluid network through which fluid flows, and a plurality of gas actuators integral with the substrate. One such gas actuator is coupled to the network at a first location for providing gas pressure to move a microfluidic sample within the network. Another gas actuator is coupled to the network at a second location for providing gas pressure to further move at least a portion of the microfluidic sample within the network. A valve is coupled to the microfluidic network so that, when the valve is closed, it substantially isolates the second gas actuator from the first gas actuator.

L3 ANSWER 4 OF 25 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:748950 CAPLUS
TITLE: Methods and systems for processing microfluidic samples of particle containing fluids

INVENTOR(S): Parunak, Gene; Handique, Kalyan; Wu, Betty; Kehrer, Aaron
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., Cont.-in-part of Ser. No. US 2001-953921, filed on 18 Sep 2001 which is a contin
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 8
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002141903	A1	20021003	US 2001-14520	20011214
US 2002143437	A1	20021003	US 2001-819105	20010328
US 7010391	B2	20060307		
WO 2003012406	A1	20030213	WO 2002-US9440	20020327
WO 2003012406	A9	20030320		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1438567	A1	20040721	EP 2002-715213	20020327
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004537695	T	20041216	JP 2003-517479	20020327

PRIORITY APPLN. INFO.:		
US 2001-819105	A2	20010328
US 2001-307638P	P	20010726
US 2001-953921	A2	20010918
US 2001-14519	A	20011214
US 2001-14520	A	20011214
US 2002-75371	A	20020215
WO 2002-US9440	W	20020327
WO 2002-US9441	W	20020327

AB The present invention relates to a microfluidic system for processing a cell-containing liquid. The system includes a microfabricated substrate having an enrichment channel to prepare an enriched cell sample from the cell-containing liquid. A flow through member is in liquid communication with the enrichment zone. The flow through member substantially prevents cells of the cell-containing fluid from exiting the enrichment zone while allowing liquid of the cell-containing liquid to exit the enrichment zone. A gas actuator associated with the enrichment zone provides a gas pressure sufficient to move the enriched cell sample from the enrichment zone.

L3 ANSWER 5 OF 25 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:443848 CAPLUS
DOCUMENT NUMBER: 137:142259
TITLE: Active microfluidic mixer and gas bubble filter driven by thermal bubble micropump
AUTHOR(S): Tsai, Jr-Hung; Lin, Liwei
CORPORATE SOURCE: Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI, USA
SOURCE: Sensors and Actuators, A: Physical (2002), A97-98, 665-671
CODEN: SAAPEB; ISSN: 0924-4247
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal

LANGUAGE: English

AB A microfluidic mixer with a gas bubble filter activated by a thermal bubble actuated nozzle-diffuser micropump is successfully demonstrated. The oscillatory flow generated by the micropump can induce wavy interface to increase the contact area of mixing fluids to accelerate the mixing process. The microfluidic mixing channels are 200 μm wide, 50 μm deep and the speed of the mixing liqs. are measured at 6.5 μL/min. The optimal mixing result is found when the actuating frequency of thermal bubble reaches 200 Hz. Normalized gray-scale values that correspond to the completeness of the mixing effect are observed to be proportional to the one-third power of the input pulse frequency. Furthermore, a gas bubble filter is integrated and successfully demonstrated in the microfluidic mixing system. A model based on the principle of threshold pressure with respect to the geometry of microchannels is established.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 6 OF 25 INSPEC (C) 2007 IET on STN

ACCESSION NUMBER: 2007:9361979 INSPEC

TITLE: Transient thermal response of SMA actuator under gas-jet impingement

AUTHOR: Guo-xin Hu; Li-xiang Zhang (Sch. of Mech. & Power Eng., Shanghai Jiaotong Univ., China)

SOURCE: Sensors and Actuators A (Physical) (8 Jan. 2007), vol.133, no.1, p. 152-60, 27 refs.
CODEN: SAAPEB, ISSN: 0924-4247
SICI: 0924-4247(20070108)133:1L.152:TTRA;1-D
Doc.No.: S0924-4247(06)00286-X
Published by: Elsevier, Switzerland

DOCUMENT TYPE: Journal

TREATMENT CODE: Practical; Experimental

COUNTRY: Switzerland

LANGUAGE: English

AN 2007:9361979 INSPEC

AB Transient thermal response of shape memory alloy actuator under gas-jet impingement has been investigated numerically and experimentally. Two-dimensional incompressible and unsteady flow (both hydrodynamically and thermally) is solved using the standard k-ε turbulence model and energy conservation equation. The solid region is simulated by coupling the fluid with moving and static boundary condition at the fluid-solid interface, respectively. Much attention was focused on the effects of jet velocity and periods on temperature fields and shape deformation of the SMA actuator. Results show that the temperature of the actuator for static boundary condition is slightly higher than for moving boundary condition and the difference increases along the flow direction. The difference of temperature and the shape deformation on the surface of SMA increase with the increasing of exit velocity and jet periods. The numerical simulation and the experiment have been performed with the following parameters: $16 \le vin \le 40 m/s$, $L/D=5$, $2 \le T \le 12 s$. An experimental apparatus about periodic jet impingement is set up to study the transient thermal response and heat transfer between the jet gas and the SMA actuator. The effect of the jet period and velocity on the transient thermal response was investigated in detail. The results of the numerical simulation are shown in good agreement with the experimental data.

L3 ANSWER 7 OF 25 INSPEC (C) 2007 IET on STN

ACCESSION NUMBER: 2006:9129371 INSPEC

TITLE: Out-of-plane knife-gate microvalves for controlling large gas flows

AUTHOR: Haasl, S.; (Sch. of Electr. Eng., R. Inst. of Technol., Stockholm, Sweden), Braun, S.; Ridgeway,

A.S.; Sadoon, S.; van der Wijngaart, W.; Stemme, G.
SOURCE: Journal of Microelectromechanical Systems (Oct. 2006), vol.15, no.5, p. 1281-8, 23 refs.
CODEN: JMIYET, ISSN: 1057-7157
SICI: 1057-7157(200610)15:5L.1281:PKGM;1-2
Published by: IEEE, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical
COUNTRY: United States
LANGUAGE: English
AN 2006:9129371 INSPEC
AB This paper considers design issues for microvalves for large gas flow control. It introduces out-of-plane knife-gate microvalves as a novel design concept and a proportional microvalve concept for pressure control applications. The design of three different actuator-gate configurations and first prototypes are presented. The first valve prototypes feature thermal silicon-aluminum bimorph actuators and the pressure-flow performance per chip area of the demonstrator valve presented is greatly increased using out-of-plane actuation and an out-of-plane orifice. The characterization of the actuators and of the pressure-flow performance is presented. The prototype valve allows for a flow change of ΔQ= 3.4 standard liters per minute (SLPM) at a pressure change of ΔP= 95 kPa (Pin= 196.3 kPa, Pout= 101.3 kPa) on an active chip area of only 2.3+3.7 mm21515

L3 ANSWER 8 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2006:8965352 INSPEC
TITLE: Design, fabrication and characterization of a novel gas microvalve using micro- and fine-machining
AUTHOR: Fazal, I.; Louwerse, M.C.; Jansen, H.V.; Elwenspoek, M.C. (MESA+ Res. Inst., Univ. of Twente EWI/TST, Enshede, Netherlands)
SOURCE: Journal of Micromechanics and Microengineering (July 2006), vol.16, no.7, p. 1207-14, 14 refs.
CODEN: JMMIEZ, ISSN: 0960-1317
SICI: 0960-1317(200607)16:7L.1207:DFCN;1-X
Price: 0960-1317/06/071207+08$30.00
Doc.No.: S0960-1317(06)21043-X
Published by: IOP Publishing, UK
DOCUMENT TYPE: Journal
TREATMENT CODE: New Development; Practical; Experimental
COUNTRY: United Kingdom
LANGUAGE: English
AN 2006:8965352 INSPEC
AB In this paper, we present the design, fabrication and characterization of a novel gas microvalve realized by combining micro- and fine-machining techniques. The design is for high flow rates at high pressure difference between inlet and outlet, burst pressure of up to 15 bars. There is no power consumption required for the valve to maintain its position during operation in any intermediate state and the process gas does not interact with the actuation mechanism. The microvalve was experimentally characterized with air flows. It is shown that flow rates of 220 ml min-1 at a pressure difference of 4 bars could be achieved with a minimum accurate flow rate of 4 ml min-1

L3 ANSWER 9 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2005:8461910 INSPEC
DOCUMENT NUMBER: B2005-07-8380M-013
TITLE: A hybrid PZT-silicon microvalve
AUTHOR: Duggirala, R.; Lal, A. (Sch. of Electr. & Comput. Eng., Cornell Univ., Ithaca, NY, USA)
SOURCE: Journal of Microelectromechanical Systems (June 2005), vol.14, no.3, p. 488-97, 20 refs.
CODEN: JMIYET, ISSN: 1057-7157

SICI: 1057-7157(200506)14:3L.488:HSM;1-Z
Price: 1057-7157/$20.00
Published by: IEEE, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2005:8461910 INSPEC DN B2005-07-8380M-013
AB A low-voltage, low-power microvalve for compact battery-powered portable microfluidic platforms is designed, fabricated and experimentally characterized. The microvalve employs laser-machined piezoelectric unimorphs mechanically linked to surface micromachined nickel structures anchored on corrugated SixNy-Parylene composite membrane tethers. The Parylene layer also serves as a compliant sealing layer on the valve seat for reducing the leakage in the off state. A mechanical linking process to connect the bulk piezoelectric unimorphs to micromachined diaphragms in a self-aligned manner has been developed. The design enables large strokes (2.45 μm) at low-actuation voltages (10 V) consuming a comparatively low switching energy (678 nJ). The dependence of the measured flow rates on the modulated clearance over the orifice was found to be in good agreement with the theory of laminar flow in the low (1-100) Reynolds number regime. The microvalve was experimentally characterized for both gas and liquid flows. For example, at 10 V unimorph actuation, a gas flow rate of 420 μL/min at a differential pressure of 9.66 kPa was measured. The off-state leakage rate for 0 V actuation is estimated to be 10-20 μL/min. Typical flow rates with pulse width modulated (PWM) actuation with 50% duty cycle at 20 Vpp (1 kHz) were measured to be 770 μL/min at 6.9 kPa for gases and 2.77 μL/min at 4.71 kPa for liquids

L3 ANSWER 10 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2004:8032456 INSPEC
DOCUMENT NUMBER: B2004-08-2575D-076; C2004-08-3260P-018
TITLE: A seat microvalve nozzle for optimal gas flow capacity at large controlled pressure
AUTHOR: van der Wijngaart, W.; (Dept. of Signals Sensor & Syst., R. Inst. of Technol., Stockholm, Sweden), Thorsen, A.; Stemme, G.
SOURCE: 17th IEEE International Conference on Micro Electro Mechanical Systems. Maastricht MEMS 2004 Technical Digest (IEEE Cat. No.04CH37517), 2004, p. 233-6 of li+868 pp., 15 refs.
ISBN: 0 7803 8265 X
Price: 0 7803 8265 X/2004/$17.00
Published by: IEEE, Piscataway, NJ, USA
Conference: 17th IEEE International Conference on Micro Electro Mechanical Systems. Maastricht MEMS 2004 Technical Digest, Maastricht, Netherlands, 25-29 Jan. 2004
Sponsor(s): IEEE; Robotics and Automation Soc
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Theoretical
COUNTRY: United States
LANGUAGE: English
AN 2004:8032456 INSPEC DN B2004-08-2575D-076; C2004-08-3260P-018
AB Seat microvalves are the most common microvalve type for gas flow control. This paper presents a general method for optimising the flow capacity of a seat valve nozzle and diminishing the requirements on the valve actuator's stroke-length. Geometrical analysis and finite element (FE) simulations show that for controlling large gas flow at elevated pressure, the optimal nozzle design in terms of flow capacity for a given actuator performance is a multiple-orifice arrangement with miniaturised circular nozzles. Experimental results support the design introduced in this paper

L3 ANSWER 11 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2004:7936526 INSPEC
DOCUMENT NUMBER: A2004-11-0130C-013; B2004-05-0100-070
TITLE: TRANSDUCERS '03. 12th International Conference on Solid-State Sensors, Actuators and Microsystems. Digest of Technical Papers (Cat. No.03TH8664)
SOURCE: vol.1, 2003, 2 vol.(xl+xxxix+1938) pp., Also available on CD-ROM in PDF format
ISBN: 0 7803 7731 1
Price: 03/$17.00
Published by: IEEE, Piscataway, NJ, USA
Conference: IEEE International Solid-State Sensors and Actuators Conference, Boston, MA, USA, 8-12 June 2003
Sponsor(s): IEEE; Electron Devices Soc
DOCUMENT TYPE: Conference Proceeding
COUNTRY: United States
LANGUAGE: English
AN 2004:7936526 INSPEC DN A2004-11-0130C-013; B2004-05-0100-070
AB The following topics are dealt with: fluidic manipulation systems; on-chip power; chemical sensors; accelerometers; in-vivo biosensors; gas sensing systems; microvalves and pumps; gyros; nanostructure fabrication; optical microsystems; genomics and DNA processing; audio and ultrasound technology; nanostructure fabrication; microrobotic actuators; micro analytical systems components; magnetic and infrared sensors; micro resonator damping; large displacement actuators; droplet dispensing; fluid sensing systems; device and materials characterization; electrostatic actuators; force mass sensors; gas sensors; micro grippers; micro optical systems; micro fluidic actuators; microfluidic systems and components; micropower generator; new materials; polymer microfabrication technologies; RF MEMS: components and packaging; ultrasound, acoustic and pressure sensors; biomedical prosthesis; integrated biosystems; polymer microsystems; micromanipulation and sensing; biophysical sensors cell sensing and manipulation; integrated fabrication technologies; dynamics of microscale systems; energy and force sensors biotechnology; non-silicon materials fabrication; bio sensing devices; biochips; device design and simulation fabrication and packaging of microfluidic devices; gas sensing systems; inertial sensors; micro actuators micro needles micro optical components; microfabrication with metals; microvalves; silicon microfabrication technologies; RF microsystems; integrated chemical microprocessing; bio physical interfaces; optical MEMS technologies; nano fluidic manipulation; packaging and encapsulation; physical models; environmental sensors and systems; nano fluidic manipulation; Gas phase microsystems

L3 ANSWER 12 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2003:7664015 INSPEC
DOCUMENT NUMBER: B2003-07-2575-035
TITLE: Thermal transpiration as a co-located micro-scale source of high pressure gas for MEMS devices
AUTHOR: Young, M.; Shiflett, G.; Muntz, E.P.; (Dept. of Aerosp. & Mech. Eng., Univ. of Southern California, Los Angeles, CA, USA), Vargo, S.
SOURCE: Micro-Electro-Mechanical Systems (MEMS). 2001 ASME International Mechanical Engineering Congress and Exposition, 2001, p. 629-38 of xii+892 pp., 27 refs.
Editor(s): Lee, A.P.; Keynton, R.S.; Simon, J.; Malshe, A.; Breuer, K.; Mou, J-I.; Chen, S.; Dunn, M.
ISBN: 0 7918 3555 3
Published by: ASME, New York, NY, USA
Conference: Micro-Electro-Mechanical Systems (MEMS). 2000 ASME International Mechanical Engineering Congress and Exposition, New York, NY, USA, 11-16 Nov.

2001
Sponsor(s): ASME
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Application; Theoretical
COUNTRY: United States
LANGUAGE: English
AN 2003:7664015 INSPEC DN B2003-07-2575-035
AB Applications of the Knudsen Compressor, a thermal transpiration pump, as a co-located source of high-pressure gas (greater than 1 atm) for MEMS valves, actuators, and fluid flow devices has been investigated. Relying only on existing materials and technologies, it is shown that it should be possible to construct MEMS Knudsen Compressors to provide compressed gas up to pressures of about 10 atm while making use of ambient gases as the working medium. The theoretical performance of Knudsen Compressors operating from 1 atm up to 10 atm is evaluated with a previously developed rarefied gas dynamic, transitional flow model for Knudsen Compressor cascades. In one design a 27 stage Knudsen Compressor provides a pressure increase from 1 atm to 10 atm at a flow rate of 2+10-3 atm-cm3/s. The compressor occupies a volume of 40 mm3 and has a power requirement of 0.25 W. An apparent high-pressure limit for Knudsen Compressors, roughly 100 atm, is discussed. The pressure range between 10 atm and 100 atm requires nanometer and smaller size capillaries in the transpiration membrane. Several physical effects that become important at these small dimensions are identified and discussed along with their qualitative influence on the performance of the Knudsen Compressor. It is concluded that existing materials with subnanometer capillaries have thermal conductivities that are too high, leading to inappropriate power consumption for a MEMS device; for now, the practical upper limit on the pressure to which a MEMS Knudsen Compressor can operate is around 10 atm

L3 ANSWER 13 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2003:7657118 INSPEC
DOCUMENT NUMBER: B2003-07-8380M-008; C2003-07-3260P-006
TITLE: A two-stage discrete peristaltic micropump
AUTHOR: Berg, J.M.; Anderson, R.; Anaya, M.; (Dept. of Mech. Eng., Texas Tech. Univ., Lubbock, TX, USA), Lahlouh, B.; Holtz, M.; Dallas, T.
SOURCE: Sensors and Actuators A (Physical) (15 March 2003), vol.A104, no.1, p. 6-10, 18 refs.
CODEN: SAAPEB, ISSN: 0924-4247
SICI: 0924-4247(20030315)A104:1L.6:SDPM;1-1
Price: 0924-4247/03/$30.00
Doc.No.: S0924-4247(02)00434-X
Published by: Elsevier, Switzerland
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: Switzerland
LANGUAGE: English
AN 2003:7657118 INSPEC DN B2003-07-8380M-008; C2003-07-3260P-006
AB We demonstrate a discrete, two-stage peristaltic micropump for applications in microfluidics. Prototypes are fabricated in polydimethylsiloxane (PDMS) with water as the working fluid. Off-wafer compressed nitrogen gas provides the actuation energy. The device may be operated in three- or two-stage modes for direct comparison. We show that two-stage pumps have comparable flow rates to the three-stage counterparts, and produce 2/3 the static head. Our results suggest that two-stage pumps may be a viable choice under low backpressure conditions where available on-chip area or the number of external connections is limited

L3 ANSWER 14 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2002:7423915 INSPEC
DOCUMENT NUMBER: B2002-12-2575F-004; C2002-12-3260P-003

TITLE: Surface micromachined paraffin-actuated microvalve
AUTHOR: Carlen, E.T.; (Corning IntelliSense Corp., Wilmington, MA, USA), Mastrangelo, C.H.
SOURCE: Journal of Microelectromechanical Systems (Oct. 2002), vol.11, no.5, p. 408-20, 44 refs.
CODEN: JMIYET, ISSN: 1057-7157
SICI: 1057-7157(200210)11:5L.408:SMPA;1-6
Price: 1057-7157/02/$17.00
Published by: IEEE, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2002:7423915 INSPEC DN B2002-12-2575F-004; C2002-12-3260P-003
AB Normally-open microvalves have been fabricated and tested which use a paraffin microactuator as the active element. The entire structure with nominal dimension of ϕ600 μm + 30 μm is batch-fabricated by surface micromachining the actuator and channel materials on top of a single substrate. Gas flow rates in the 0.01-0.1 sccm range have been measured for several devices with actuation powers ranging from 50 to 150 mW on glass substrates. Leak rates as low as 500 μsccm have been measured. The normally-open blocking microvalve structure has been used to fabricate a precision flow control system of microvalves consisting of four blocking valve structures. The control valve is designed to operate over a 0.01-5.0 sccm flow range at a differential pressure of 800 torr. Flow rates ranging from 0.02 to 4.996 sccm have been measured. Leak rates as low as 3.2 msccm for the four valve system have been measured

L3 ANSWER 15 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2002:7371713 INSPEC
DOCUMENT NUMBER: B2002-10-2575-031
TITLE: Active microfluidic mixer and gas bubble filter driven by thermal bubble micropump
AUTHOR: Jr-Hung Tsai; (Dept. of Mech. Eng., Michigan Univ., Ann Arbor, MI, USA), Liwei Lin
SOURCE: Sensors and Actuators A (Physical) (1 April 2002), vol.A97-98, p. 665-71, 6 refs.
CODEN: SAAPEB, ISSN: 0924-4247
SICI: 0924-4247(20020401)A9798L.665:AMMB;1-7
Price: 0924-4247/02/$22.00
Doc.No.: S0924-4247(02)00031-6
Published by: Elsevier, Switzerland
Conference: Sens. Actuators A, Phys. (Switzerland)
DOCUMENT TYPE: Conference; Conference Article; Journal
TREATMENT CODE: Experimental
COUNTRY: Switzerland
LANGUAGE: English
AN 2002:7371713 INSPEC DN B2002-10-2575-031
AB A microfluidic mixer with a gas bubble filter activated by a thermal bubble actuated nozzle-diffuser micropump is successfully demonstrated. The oscillatory flow generated by the micropump can induce wavy interface to increase the contact area of mixing fluids to accelerate the mixing process. The microfluidic mixing channels are 200 μm wide, 50 μm deep and the speed of the mixing liquids are measured at 6.5 μl/min. The optimal mixing result is found when the actuating frequency of thermal bubble reaches 200 Hz. Normalized gray-scale values that correspond to the completeness of the mixing effect are observed to be proportional to the one-third power of the input pulse frequency. Furthermore, a gas bubble filter is integrated and successfully demonstrated in the microfluidic mixing system. A model based on the principle of threshold pressure with respect to the geometry of microchannels is established

L3 ANSWER 16 OF 25 INSPEC (C) 2007 IET on STN

ACCESSION NUMBER: 2002:7347979 INSPEC
DOCUMENT NUMBER: A2002-18-0710C-006; B2002-09-2575F-037; C2002-09-3260P-018
TITLE: Thermal bubble powered microfluidic mixer with gas bubble filter
AUTHOR: Jr-Hung Tsai; (Dept. of Mech. Eng., Michigan Univ., Ann Arbor, MI, USA), Liwei Lin
SOURCE: TRANSDUCERS '01. EUROSENSORS XV. 11th International Conference on Solid-State Sensors and Actuators. Digest of Technical Papers, vol.2, 2001, p. 966-9 vol.2 of 2 vol. 1807 pp., 6 refs.
Editor(s): Obermeier, E.
ISBN: 3 540 42150 5
Published by: Springer-Verlag, Berlin, Germany
Conference: Proceedings of 11th International Conference on Solid State Sensors and Actuators Transducers '01/Eurosensors XV, Munich, Germany, 10-14 June 2001
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: Germany
LANGUAGE: English

AN 2002:7347979 INSPEC DN A2002-18-0710C-006; B2002-09-2575F-037; C2002-09-3260P-018
AB A microfluidic mixer with a gas bubble filter powered by a thermal bubble actuated nozzle-diffuser micropump is successfully demonstrated. The oscillatory flow generated by the micropump can induce wavy interface to increase the contact area of the mixing liquids and accelerate the mixing process. It is found that the mixing effect can be optimized when the pumping frequency reaches 200 Hz in a 200 μm wide, 50 μm deep microchannel with a pumping volume flow rate of 6.5 μl/min. The mixing process is accelerated when the pulse frequency is increased until a certain frequency. Experimental results on normalized gray-scale measurements show that the grayscale values that correspond to the mixing effect increase proportionally to the one-third power of the pumping pulse frequency. In addition to the micromixer, a gas bubble filter based on the working principle of pressure barrier caused by the channel geometry is also demonstrated experimentally. A simple model for estimating the pressure barrier caused by the microchannel geometry is developed

L3 ANSWER 17 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2002:7287456 INSPEC
DOCUMENT NUMBER: A2002-14-4780-006; B2002-07-7320W-009
TITLE: Experimental investigation on phase transformation type micropump
AUTHOR: Li Zhixin; Wang Moran; Tan Liyan (Dept. of Eng. Mech., Tsinghua Univ., Beijing, China)
SOURCE: Chinese Science Bulletin (March 2002), vol.47, no.6, p. 518-22, 16 refs.
CODEN: CSBUEF, ISSN: 1001-6538
SICI: 1001-6538(200203)47:6L.518:EIPT;1-W
Published by: Science Press, China
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: China
LANGUAGE: English

AN 2002:7287456 INSPEC DN A2002-14-4780-006; B2002-07-7320W-009
AB The phase transformation type micropump without moving parts was experimentally studied in this note. To analyze the pumping mechanism of the micropump, a simplified physical model was presented. The experimental results indicate that the pump characteristic is mainly dependent on the heating and cooling conditions. For a given system, there exist an optimal combination of heating current and switch time

with which the flow rate reaches maximum. Comparing with the natural cooling, the forced convective cooling needs larger heating current to obtain the same flow rate. In our experiments, the maximum flow rate is 33 μL/min when the inner diameter of the micropump is 200 μm, and the maximum pumping pressure reaches over 20 kPa. The theoretical analysis shows that the pumping mechanism of the micropump mainly lies in the large density difference between liquid and gas phases and the effect of gas chocking

L3 ANSWER 18 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2000:6636050 INSPEC
DOCUMENT NUMBER: B2000-08-8380M-017; C2000-08-3260P-020
TITLE: Paraffin actuated surface micromachined valves
AUTHOR: Carlen, E.T.; Mastrangelo, C.H. (Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA)
SOURCE: Proceedings IEEE Thirteenth Annual International Conference on Micro Electro Mechanical Systems (Cat. No.00CH36308), 2000, p. 381-5 of xiv+810 pp., 10 refs.
ISBN: 0 7803 5273 4
Price: 0 7803 5273 4/2000/$10.00
Published by: IEEE, Piscataway, NJ, USA
Conference: Proceedings IEEE Thirteenth Annual International Conference on Micro Electro Mechanical Systems, Miyazaki, Japan, 23-27 Jan. 2000
Sponsor(s): IEEE Robotics & Autom. Soc.; Micromachine Center
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Application; New Development; Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2000:6636050 INSPEC DN B2000-08-8380M-017; C2000-08-3260P-020
AB A new, active, normally-open blocking microvalve that uses the thermal expansion of a sealed, thin paraffin patch for actuation has been fabricated and tested. The entire structure is batch-fabricated by surface micromachining the actuator and channel materials on top of a single substrate. The paraffin actuated microvalves are suitable for applications requiring many devices on a single die, low processing temperatures, and simple, nonbonded process technology. Gas flow rates in the 0.1-2.0 sccm range have been measured for several devices with actuation powers less than 50 mW

L3 ANSWER 19 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2000:6557712 INSPEC
DOCUMENT NUMBER: B2000-05-7230L-061; C2000-05-3240P-003
TITLE: Microfluidic system for the integration of gas sensors
AUTHOR: Meckes, A.; Benecke, W. (Bremen Univ., Germany)
SOURCE: MICRO SYSTEM Technologies 98. 6th International Conference on Micro Electro, Opto, Mechanical Systems and Components, 1998, p. 577-82 of 756 pp., 7 refs.
Editor(s): Reichl, H.; Obermeier, E.
ISBN: 3 8007 2421 9
Published by: VDE Verlag, Berlin, Germany
Conference: Proceedings of MICRO SYSTEM Technologies 98, Potsdam, Germany, 1-3 Dec. 1998
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: Germany
LANGUAGE: English
AN 2000:6557712 INSPEC DN B2000-05-7230L-061; C2000-05-3240P-003
AB This paper describes the main parts of a microsystem for the integration and cyclic operation of gas sensors: an arrangement of channels leading into cavities being the sensors place, called fluidic system, and actuators, microvalves and micropumps with electromagnetic actuation

designed to be modular integrated to the fluidic system

L3 ANSWER 20 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 1999:6381435 INSPEC
DOCUMENT NUMBER: B1999-11-8380M-026; C1999-11-3260P-030
TITLE: A full-wafer mounted self-priming and bubble-tolerant piezoelectric silicon micropump
AUTHOR: Linnemann, R.; Richter, M.; Leistner, A.; Woias, P. (Fraunhofer-Inst. for Solid State Technol., Munich, Germany)
SOURCE: ACTUATOR 98. 6th International Conference on New Actuators with Accompanying Exhibition. Conference Proceedings, 1998, p. 78-81 of 613 pp., 11 refs.
Editor(s): Borgmann, H.
ISBN: 3 933339 00 6
Published by: Messe Bremen GmbH, Bremen, Germany
Conference: Proceedings of Actuator 98 6th International Conference on New Actuators, Bremen, Germany, 17-19 June 1998
Sponsor(s): Small Business, Technol.; Eur. Affairs
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: Germany
LANGUAGE: English
AN 1999:6381435 INSPEC DN B1999-11-8380M-026; C1999-11-3260P-030
AB In this paper we present a silicon micro diaphragm pump for liquids and gases with self-priming and bubble-tolerant operation characteristics. The micropump consists of two passive check valves at the inlet and outlet port and a piezoelectrically actuated pump diaphragm. The microfluidic device is designed to yield a pump rate of about 1 ml/min for water and 3.8 ml/min for gases. Moreover, the design and the set-up of the micropump are prepared for the application of full-wafer mounting technologies; these technologies allow the manufacturing of a low-cost and high-quality product. The production of the micropump components is based on dry and wet etching silicon technologies. Silicon fusion bonding and anodic bonding techniques are used for stacking of the valve unit. The self-priming and bubble-tolerant operation mode is achieved by enlarging the compression ratio of the micropump. These measures yield on an easy-to-use device for industrial and research applications

L3 ANSWER 21 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 1999:6375518 INSPEC
DOCUMENT NUMBER: B1999-11-8380M-011; C1999-11-3260P-010
TITLE: An 8-bit microflow controller using pneumatically-actuated microvalves [for semiconductor process gases]
AUTHOR: Rich, C.A.; Wise, K.D. (Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA)
SOURCE: Technical Digest. IEEE International MEMS 99 Conference. Twelfth IEEE International Conference on Micro Electro Mechanical Systems (Cat. No.99CH36291), 1999, p. 130-4 of xxxvi+660 pp., 18 refs.
ISBN: 0 7803 5194 0
Price: 0 7803 5194 0/99/$10.00
Published by: IEEE, Piscataway, NJ, USA
Conference: Proceedings of 12th International Workshop on Micro Electro Mechanical Systems - MEMS, Orlando, FL, USA, 17-21 Jan. 1999
Sponsor(s): IEEE Robotics & Autom. Soc
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Application; Practical; Experimental
COUNTRY: United States
LANGUAGE: English

AN 1999:6375518 INSPEC DN B1999-11-8380M-011; C1999-11-3260P-010
AB This paper reports a pneumatically actuated, integrated 8-bit mass microflow controller (μFC) that utilizes silicon microvalves. It is intended for the precision control of semiconductor process gases in the range from 0.1 to 10 sccm. The structure was designed to be batch-fabricated and compatible with on-chip thermopneumatic actuation. Assembled μFC devices operate over a flow range of 0.5-10 sccm at 16 psid (800 torr). The valves alone may achieve significantly higher flow rates. Valve leak rates are as low as 10-3 sccm under 26 psig actuation pressure. Depositing parylene on the microvalves further improves leak rates by a factor as great as 3.5. This lays the foundation for a precision 0.1-10 sccm microflow controller for process gases, as well as a reliable silicon microvalve for other applications

L3 ANSWER 22 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 1999:6375509 INSPEC
DOCUMENT NUMBER: C1999-11-3260P-009
TITLE: A modular integrated pressure control unit for gases
AUTHOR: Schaible, J.; Messner, S.; Muller, M.; Fuchs, N.; Sandmaier, H.; Zengerle, R. (Inst. of Micromachining & Inf. Technol., Hahn-Schickard-Gesellschaft, Villingen, Germany)
SOURCE: Technical Digest. IEEE International MEMS 99 Conference. Twelfth IEEE International Conference on Micro Electro Mechanical Systems (Cat. No.99CH36291), 1999, p. 77-81 of xxxvi+660 pp., 3 refs.
ISBN: 0 7803 5194 0
Price: 0 7803 5194 0/99/$10.00
Published by: IEEE, Piscataway, NJ, USA
Conference: Proceedings of 12th International Workshop on Micro Electro Mechanical Systems - MEMS, Orlando, FL, USA, 17-21 Jan. 1999
Sponsor(s): IEEE Robotics & Autom. Soc
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 1999:6375509 INSPEC DN C1999-11-3260P-009
AB A new concept for application specific realization of micropneumatical systems will be presented for the first time. It allows the modular integration of micromechanical valves (2-way, 3-way) and sensors (pressure, flow, etc.) for creating closed loop systems having minimized dead volume and response time. Following the smallest industrial standard size of pneumatic valves, the width of each component housing is fixed to 10 mm. The concept for modular integration has been successfully proved by building up a pressure control unit for gases. It basically consists of a microprocessor for digital control, two electrostatically actuated microvalves, electronics to drive the valves and a pressure sensor

L3 ANSWER 23 OF 25 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 1999:6332311 INSPEC
DOCUMENT NUMBER: B1999-10-8380M-002; C1999-10-3260P-004
TITLE: Liquid and gas-liquid phase behavior in thermopneumatically actuated microvalves
AUTHOR: Henning, A.K. (Redwood Microsyst. Inc., Menlo Park, CA, USA)
SOURCE: Proceedings of the SPIE - The International Society for Optical Engineering (1998), vol.3515, p. 53-63, 16 refs.
CODEN: PSISDG, ISSN: 0277-786X
SICI: 0277-786X(1998)3515L.53:LLPB;1-8
Price: 0277-786X/98/$10.00
Published by: SPIE-Int. Soc. Opt. Eng, USA
Conference: Microfluidic Devices and Systems, Santa

Clara, CA, USA, 21-22 Sept. 1998
Sponsor(s): SPIE
DOCUMENT TYPE: Conference; Conference Article; Journal
TREATMENT CODE: Practical; Theoretical
COUNTRY: United States
LANGUAGE: English
AN 1999:6332311 INSPEC DN B1999-10-8380M-002; C1999-10-3260P-004
AB Previous work has discussed the details of the liquid and gas-liquid behavior of the hermetically-sealed control fluid. Figures of merit were developed for membrane behavior as a function of Young's modulus, valve structural parameters, and some of the thermodynamic properties of the thermopneumatic control fluid. However, the effects of initial thermodynamic state of the control fluid, external temperature (including thermal gradient), external pressure, and the temperature boundary condition at the control fluid's heat source were not considered. In this work, these effects are considered quantitatively. A model for the steady-state valve behavior (membrane deflection versus input heater power) is developed. The utility of this model in designing microvalves for gas and liquid flow control is also demonstrated

L3 ANSWER 24 OF 25 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2003(11):3544 COMPENDEX
TITLE: A two-stage discrete peristaltic micropump.
AUTHOR: Berg, J.M. (Department of Mechanical Engineering Texas Tech University, Lubbock, TX 79409, United States); Anderson, R.; Anaya, M.; Lahlouh, B.; Holtz, M.; Dallas, T.
SOURCE: Sensors and Actuators, A: Physical v 104 n 1 Mar 15 2003 2003.p 6-10
SOURCE: Sensors and Actuators, A: Physical v 104 n 1 Mar 15 2003 2003.p 6-10
CODEN: SAAPEB ISSN: 0924-4247
PUBLICATION YEAR: 2003
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2003(11):3544 COMPENDEX
AB We demonstrate a discrete, two-stage peristaltic micropump for applications in microfluidics. Prototypes are fabricated in polydimethyl-siloxane (PDMS) with water as the working fluid. Off-wafer compressed nitrogen gas provides the actuation energy.
The device may be operated in three- or two-stage modes for direct comparison. We show that two-stage pumps have comparable flow rates to the three-stage counterparts, and produce [similar to]2/3 the static head. Our results suggest that two-stage pumps may be a viable choice under low backpressure conditions where available on-chip area or the number of external connections is limited. $CPY 2002 Elsevier Science B.V. All fights reserved. 18 Refs.

L3 ANSWER 25 OF 25 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2002(30):2295 COMPENDEX
TITLE: Active microfluidic mixer and gas bubble filter driven by thermal bubble micropump.
AUTHOR: Tsai, Jr-Hung (Department of Mechanical Engineering University of California, Berkeley, CA 94720-1740, United States); Lin, Liwei
MEETING TITLE: Transducers'01 Eurosensors XV.
MEETING LOCATION: Munich, Germany
MEETING DATE: 10 Jun 2001-14 Jun 2001
SOURCE: Sensors and Actuators, A: Physical v 97-98 Apr 1 2002 2002.p 665-671
SOURCE: Sensors and Actuators, A: Physical v 97-98 Apr 1 2002 2002.p 665-671
CODEN: SAAPEB ISSN: 0924-4247

PUBLICATION YEAR: 2002
MEETING NUMBER: 59358
DOCUMENT TYPE: Conference Article
TREATMENT CODE: General Review
LANGUAGE: English
AN 2002(30):2295 COMPENDEX
AB A microfluidic mixer with a gas bubble filter activated by a thermal bubble actuated nozzle-diffuser micropump is successfully demonstrated. The oscillatory flow generated by the micropump can induce wavy interface to increase the contact area of mixing fluids to accelerate the mixing process. The microfluidic mixing channels are 200 mum wide, 50 mum deep and the speed of the mixing liquids are measured at 6.5 mul/min. The optimal mixing result is found when the actuating frequency of thermal bubble reaches 200 Hz. Normalized gray-scale values that correspond to the completeness of the mixing effect are observed to be proportional to the one-third power of the input pulse frequency. Furthermore, a gas bubble filter is integrated and successfully demonstrated in the microfluidic mixing system. A model based on the principle of threshold pressure with respect to the geometry of microchannels is established. 6 Refs.